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ABSTRACT

Intended for use in college-level secondary-education methods courses, the module contains text, an annotated bibliography, and overhead masters. The first section explains the federal definition of learning disabilities (LD), noting the difficulty of measuring many of the characteristics identified in the definition and the resulting increasing use of formulas to determine a discrepancy between ability and achievement. The next section lists "traditional" characteristics of learning disabilities and dyslexia, citing a variety of authors. In the third section, cognitive characteristics of learning disabled students particularly important at the secondary school level are identified and discussed, with emphasis on LD students' poor learning and memory strategies. Also noted are specific skill deficits in reading, handwriting, spelling, written production, mathematics, and social behavior and characteristics. Controversies are identified noting that there is considerable overlap between low achieving students labeled LD and low-achieving student not so labeled. Also provided are 23 references, a 26-item bibliography with abstracts, and 13 overhead masters. (DB)

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CHARACTERISTICS OF SECONDARY LD STUDENTS INSTRUCTIONAL MODULE

(An Instructional Module for Preservice or Inservice Training of Regular Secondary Educators)

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Prepared Through A
Bush Faculty Development Grant
University of South Dakota
Vermillion, South Dakota

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LD Module I

Characteristics of Secondary Learning Disabled Students

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LD Module I: Characteristics of Secondary LD Students

INTRODUCTION

This module is designed to provide infusion materials for college-level secondary methods courses. In it are lecture notes (in text form), an annotated bibliography, and overhead masters. The module is a companion piece to two other titles in this volume: Module two covers curriculum models for secondary LD students; module three contains instructional and testing modifications.

In all three modules, a trend toward viewing learning problems in terms of active cognitive information-processing is evidenced. Many of the characteristics listed in this module emanate from this theoretical stance. However, in all cases, information about competing theories will be provided. Enough information is present in the module to help undergraduate students understand important current perspectives in the field of learning disabilities.

The following topics are covered in this module. In a first section, the federal definition is explained. This is followed by a discussion of "traditional" characteristics of LD students. In a third section, the currently-accepted cognitive characteristics of middle-- and high--school LD students are discussed. In a final section, controversies about the identification of LD students are presented.

The Federal Definition

There are four important aspects of the federal definition

of learning disabilities which appears in PL 94-142 (the Education of All HAndicapped Children Act of 1975; EHA) as amended by PI 95-457. These aspects are (a) information-processing deficits, (b) psycholinguistic considerations, (c) academic and learning disorders, and (d) the "exclusionary clause". These are discussed individually below.

The information processing deficits aspect of the federal definition reflects a traditional view promulgated by Strauss and Lentinen (1947). In this view, LD consists of minimal brain damage which has, as its most basic outcome, a negative impact on the student's ability to take in, process, and act on information. The words "minimal brain dysfunction" are used where there is no direct, biological signs of brain damage.

In the great preponderance of cases there is no direct, convincing evidence of brain damage or dysfunction in LD individuals. Nonetheless, most students labeled this way will manifest idiosyncratic learning and information processing difficulties which are reminiscent of those shown by <u>some</u> individuals with mild brain damage. Increasingly sophisticated neurochemical and electrical instrumentation have produced evidence of population-wide neurological differences between LD and average learners. However, no measurement instrumentation has been developed which directly measures the putative processing disabilities engendered by the brain anomalies; certainly this diagnosis is not possible via paper-pencil tests. Thus, information processing disorders may be included in the definition to acknowledge that something is "wrong", that

learning disabilities are not the fault of the sufferer or his/her parent (Hallahan & Kauffman, 1988).

Researchers have attempted to measure several theoretical components of information processing such as, visual perception, auditory perception, and perceptual--motor integration with limited success (Arter & Jenkins, 1979; Goodman & Hammill, 1973; Hammill & Larson, 1974; Hammill, Larsen, Parker, Bagley, & Sanford, 1974; Ysseldyke, 1973). These efforts have been largely unsuccessful with research revealing either that the supposed processes were not correlated with academic performance independently of general intelligence or that efforts to increase academic responding by remediating the cognitive process in question were not fruitful.

The second aspect of the federal definition is "psycholinguistic considerations". It is assumed that deficits in basic psychological processes (if they exist) result in difficulties comprehending and producing language. Findings in the language domain parallel those reported for "basic psychological processes". That is, no clear relationship has been established between scores on psycholinguistic processing instruments and performance in the academic domains; nor has language training, per se, been shown to consistently improve performance in the basic school subjects (Hammill & Larson, 1974; but see Minskoff, 1975). In addition, the reliability and validity of test instruments based on perceptual and linguistic constructs have been brought into question (Ysseldyke & Algozzine, 1982). Thus, despite the existence of language

deficits in the federal definition it is, in practice, not always quantified in the process of identifying LD students. It should be noted that LD students do show language disorders at a rate higher than non-LD students (Gibbs & Cooper, 1989). One particularly difficult area for such students may be pragmatic use of language. Such interpersonal dimensions as conversational turn taking, for example, may be difficult for these individuals (Bryan, 1986).

The federal definition refers to academic and learning disorders. Specifically, the following seven areas are included in the definition: speaking, writing, reading (recognition and comprehension), spelling, thinking, and doing mathematical calculations. By definition, LD students perform substantially lower than their chronological-age peers in one or more of these domains (Hallahan & Kauffman, 1986; Lerner, 1989). Because the Education of All Handicapped Children Act is a law regulating access to <u>educational</u> services, a disability in an academic area is in the truest sense <u>the</u> defining characteristic of learning disabilities.

The last component of the federal definition is often called the "exclusionary clause" (Hallahan & Kauffman, 1986). Children whose primary disability is assessed to be a result of visual, hearing, or motor impairments; mental retardation; emotional disturbance; or cultural-environmental deprivation cannot be considered learning disabled.

The exclusionary clause of the federal definition remains extremely controversial. It has been argued that it remains in

the definition because of political pressure exerted by LD advocacy groups who are anxious to distinguish LD primarily from mental retardation due to the latter condition's more stigmatizing label. As the definition of LD is currently promulgated, the rather mysterious picture emerges of a youngster who fails to learn despite a near-normal score on an IQ test, typically the most reliable predictor of school performance.

A rather bleak picture of the ability to measure the characteristics felt to be central to learning disabilities appears in the preceding paragraphs. As will be discussed in the final section of this report, this is the most controversial aspect of the learning disabilities category. One response to difficulties inherent in operationalizing information processing and linguistic disorders has been that the rules and regulations for enforcing PL 94-142 have instituted subtle changes favoring measurability.

The administrative certification regulations advanced by the U. S. Office of Education include reference to performance in academic domains discrepant from estimates of general ability. The discrepancy mentioned in the administrative regulations is between ability and achievement. Ability, in this case, is estimated via scores on individually-administered general intelligence tests. Typically, a test from the Wechsler battery (Wechsler Intelligence Scale for Children-Revised, WISC-R), the Stanford-Binet, or less often the Kauffman-ABC or Part I of the Woodcock-Johnson Psychoeducational Battery is used. These instruments are more or less designed to assess general ability

(some say learning ability or potential) and report one or a few scores--the infamous Intelligence Quotient. As might be expected, any controversy that surrounds measurement of general ability--in other words those controversies surrounding the use of IQ tests--will impact upon the LD field. IQ tests are important for another reason as mentioned above. Since mental retardation is also primarily defined via performance on general ability measures, students scoring below 70 on an IQ test (within the range for mental retardation) may not be labeled learning disabled (exclusionary clause). When calculating the discrepancy, a students' expected level of performance is adjusted for IQ.

Achievement refers to a student's current level of proficiency in an academic domain indexed against the performance of children of the same age or grade. Achievement is estimated through use of an individually-administered test of achievement or, less often, through the paper-and-pencil standardized tests used in a school district. Some common individually-administered tests of achievement are the Woodcock Johnson Psychoeducational Battery (part II: Tests of Achievement), the Wide-Range Achievement Test, the Peabody Individual Tests of Achievement, and the Kauffman Test of Educational Achievement (for reviews of these instruments see Salvia & Ysseldyke, 1988; Witt, Elliot, Gresham, & Kramer, 1988).

In moving from the PL 94-142 definition to certification regulations, the domains of learning difficulties were changed to forms more compatible with testable domains from commercially

available achievement instruments. The domains are listed below:

1. Oral expression
2. Listening Comprehension
3. Written Expression
4. Basic Reading Skills (decoding/recognition)
5. Reading Comprehension
6. Mathematics Calculation
7. Mathematics Reasoning

In order to establish that a discrepancy exists, state departments of education have devised methods for comparing IQ (ability) and achievement test scores. In order for a child to be certified LD, there must be a severe discrepancy (with, of course, IQ exceeding achievement scores).

Most states use a formula to determine that a discrepancy is severe enough to warrant designating a given student as learning disabled. Elements used in the equations are IQ scores, achievement-test scores, correlations between specific IQ and achievement tests, and the age-grade of the student. Correlations between the specific tests used are considered because, if the tests are highly correlated the degree of discrepancy will be artificially underestimated. The age/grade of students is considered because a discrepancy of a certain size is more educationally significant at younger ages. For example, a 2-year discrepancy for a 6 year old first grader can be expressed as a 33% discrepancy [(2/6) X 100], whereas the same 2-year discrepancy for a 10-year-old is a 20% discrepancy [(2/10) X 100].

Traditional Characteristics

Strauss and Lehtinen (1947) noted the existence of what they supposed was a subgroup of mentally retarded students who showed a behavior pattern centering around hyperactivity and perceptual-motor problems. This so-called "Strauss Syndrome" presaged the LD field. Even though LD students are no longer considered to match perfectly the descriptions provided by Strauss and Lehtinen (1947), many of the LD students encountered by regular classroom teachers will show one or more of the following behaviors (note the degree of similarity between these behaviors and ones reported for students currently labeled as having "attention deficit--hyperactivity disorder"):

1. Erratic and inappropriate behavior on mild provocation.
2. Increased motor activity disproportionate to the stimulus.
3. Poor organization of behavior.
4. Distractibility of more than ordinary degree under ordinary conditions.
5. Persistent faulty perceptions.
6. Persistent hyperactivity.
7. Awkwardness and consistently poor motor performance.

Many such lists of the characteristics of LD students have been presented. Hallahan and Kauffman (1986) reported the following list of the ten most common behaviors reported in LD

students (Clements, 1966; see also Smith, 1988).

1. Hyperactivity
2. Perceptual-motor impairments
3. Emotional lability
4. General coordination deficits
5. Disorders of attention (short attention span, distractibility, preseveration)
6. Impulsivity
7. Disorders of memory and thinking
8. Specific academic problems (reading, arithmetic writing, spelling)
9. Disorders of speech and hearing
10. Equivocal neurological signs and electroencephalographic (EEG) irregularities

Several of the above deserve specific mention.

Perceptual and motor problems refer to difficulties hearing and seeing <u>accurately</u> over and above difficulties with acuity of the sense organs. For example, a student test have perfect vision in terms of the sharpness with which symbols impinge on the visual apparatus. Yet, the same student may make frequent letter and numeral reversals and, as a result, read slowly and ponderously. A student with perfect hearing and no obvious motivational problem may have difficulty following a set of directions. In addition, a generalized "clumsiness" and odd gait has been noted in many persons called LD (Clements, 1966; Lerner, 1989).

Disorders of attention generally are thought of as producing problems for students in maintaining attention to a task long enough to make instructional gains from it (span), being easily distracted by other stimuli in the room or failing to pick out the important aspects of what they are looking at. A related problem, impulsivity, refers to the rapid production of incorrect responses. It is as if the student does not pause to consider the probability of correctness before responding. It should be noted that, with time, there has been increasing research support for the existence of attentional problems and decreasing support for perceptual-motor disorders in LD students (Hallahan & Kauffman, 1986; Lerner, 1989).

Disorders of memory, thinking and the employment of learning strategies are often observed in LD students and may be the most pervasive problem for LD adolescents. Certainly these problems are receiving the preponderance of attention in current LD research. These will be further discussed in a subsequent section.

Irregularities in brain chemistry and EEG have been noted on a population-wide basis in LD students. However, many students with other symptoms of LD, particularly academic problems, do not show neurological signs while some randomly-selected students with no academic problems do show such signs; thus, there is not a one-to-one correspondence between learning disabilities and brain dysfunction (Hallahan & Kauffman, 1986).

It is important to note that the one problem shared by all LD students is in academics. This is, of course, an artifact of

the federal regulations where LD is defined in terms of academic difficulties. Because of the use of discrepancy formulae to certify students as LD, all students with the label will show performance in one of the academic domains far below what would be expected for their chronological and mental age, though it is not clear that LD students can be discriminated from other (nonlabeled) low-achieving students (Jenkins, 1987; Ysseldyke, Algozzine, Shinn, & McGue, 1982).

Dyslexia. A term that is commonly associated with learning disabilities is dyslexia. The single most common problem shown by LD students is in reading. In many cases this reading disorder will be very severe. Some medical doctors and instructional specialists use the term dyslexia to refer to students with clearly average or above average intellectual potential who also show very severe reading problems. As the term is currently employed in special education, there is no differentiation made between dyslexics and "other" LD students. In fact, there is little evidence that such a differential diagnosis can reliably be made. In his book Reading Without Nonsense (1978), Smith provided an excellent summary statement (about dyslexia):

> The term is a name, not an explanation. Dyslexia means, quite literally, being unable to read. Children who experience difficulty learning to read are frequently called dyslexic, but their difficulty does not arise because they are dyslexic, or have dyslexia; they

are dyslexic because they cannot read (p. 149).

This is not to say that with improved assessment technology such a disorder will not be rendered identifiable.

Currently-Understood Characteristics

Secondary teachers will encounter LD students with varying "packages" of the characteristics listed above. However, some problems are more central to adolescence and secondary education. These characteristics, as laid out in Alley and Deschler's (1979) book Teaching the Learning Disabled Adolescent: Strategies and methods.

The primary characteristics of LD adolescents that will be discussed have to do with learning and memory strategies. Other characteristics, specific to the subject areas are listed separately.

Learning and memory strategies

Torgeson and Kail (1980) found that learning disabled students, as a group, performed more like younger children on memory tasks. Interestingly, the performance of LD adolescents in these areas is believed to reflect the failure to select and use certain actions and strategies when undertaking a learning task. In other words, many LD students appear to respond passively when presented with material to learn. When strategies are taught, much of the differences between LD and non-LD youngsters disappears. Instruction designed to alleviate this so-called strategic "mediational" deficiency is presented in module 3. In addition, volitional, conscious selection of

strategies and monitoring of their use differentiates many LD and non--LD students. This latter set of abilities, ranging from awareness that a strategy is needed, to a competent selection of an appropriate strategy, to error-detection and other forms of cognitive monitoring is usually called "metacognition" (Flavell, 1970). To summarize, many LD adolescents show deficits in the following areas:

1. Use of cognitive strategies: LD students are less likely to act on information in ways that will increase the memorability of incoming information or select actions that will "personalize" information--in the sense of making it compatible with one's own memory system. For example, an LD student might not recognize the memory-enhancing structure provided by headings and subheadings in a history text. LD students do not readily employ so-called mnemonics or memory tricks and strategies (see "HOMES" example below).

2. Metacognition: LD students are less likely to be aware of the cognitive strategies (such as rehearsal) required to perform a task. In addition, LD students are less likely to perform the necessary self-checking or ongoing monitoring required to ascertain that a selected strategy is "working". For example, most high school students know that such tricks as acronyms (HOMES = the five great lakes, Huron,

Ontario, Michigan, Erie, Superior) will aid rote learning often required for tests. Not only will LD students often fail to select a strategy, but even if one is provided they may not self-test as they prepare.

Nearly all of the skill deficits listed below (Alley & Deshler, 1979) can be logically related to strategy production deficiencies and failures in metacognition. Learning disabled secondary students are less likely to use nearly every mnemonic strategy selected by researchers for study. We can summarize by saying that the main problem faced by secondary LD students is that they act passively in learning situations and do not know "how to know" (Torgeson & Kail, 1980).

Specific Skill Deficits

Reading. Most secondary LD students have a difficult time with reading material assigned by subject matter teachers. Some of the specific problems encountered by students and their classroom teachers are listed below. It is important that reading difficulties are associated at the secondary level with problems in content area classes such as science and social studies in which there is heavy reliance on reading textbooks.

1. Grade Level: LD students from average to above average general intelligence may have reading deficits running from total "word blindness" to reading skills at the seventh grade level. The average is about fourth grade level for LD high school students. McCue, Shelly, and Goldstein (1987) reported an average reading grade level of 5.59 for 100 LD

adults. However, the test they employed has been observed to overestimate reading grade levels.

2. Mechanical problems: Many LD secondary students reverse letters and words, will misread many words, and have a limited sight vocabulary.

3. Reading rate and oral reading: Because of mechanical problems, many LD readers will proceed haltingly. This will have two main implications for secondary teachers. first, many LD students will find reciting publicly to be very punishing (though certainly not all); second, it will take a typical LD student perhaps 30% to 100% longer to read the same material. Many researchers believe that reading rate or speed correlates with comprehension. Thus, a very slow reader may have trouble comprehending sentences if an idea unit takes him/her longer to read than the length of time material can be maintained in working memory.

4. Comprehension: LD students perform, on average, poorer than their non-LD counterparts in knowledge of word meanings (vocabulary), and the ability to comprehend sentences, paragraphs, and passages (in reading). This will vary from student to student, and may be singular to <u>reading</u>. That is, LD students with average or above general intelligence may understand conceptual matter at a rate commensurate with their mental age (intellectual level) so long as the material is presented alternatively (such as via taped books). As mentioned above, LD students will be less likely to impart organizational strategies in their reading

comprehension, such as self-questioning, or memory strategies to aid later recall of read material. Thus, any strategy applied externally such as advance organizers (prewritten outlines, study questions) will likely impact positively on LD students' memory. These, and other strategies, will be discussed in more detail in module 3.

Written Language. The cognitive organizational problems mentioned above also impact on the ability of LD adolescents to express themselves in writing (Alley & Deshler, 1979). LD students have been shown to have problems in several specific written expression domains.

Handwriting. Many LD students, especially those who fit the "Strauss" characteristics, may show difficult-to-read handwriting.

Spelling. Most LD students have spelling difficulties, particularly with irregular words. The magnitude of spelling difficulties can be expected to be roughly commensurate with reading problems. McCue et al. reported an average spelling grade level performance of 4.37 in LD adults.

Written Production. On average, LD youngsters have a great deal of difficulty with written expression. Reading disabled students have been shown to produce fewer words, sentences, and idea units; syntax may be poor, and more words will be misspelled. In addition, many LD writers may fail to recognize their own errors; this will make the write-revise-write process difficult for them.

Again, it is expected that written language disorders will correlate with reading problems, though it is not rare for an LD student to be identified on the basis of a written and verbal-expressive language disorder.

Mathematics. Less is known about the mathematical performance of LD students than is known about there performance in other areas. However, LD students typically perform below their age/ability expectations in math (approximately sixth grade level for high school students with problems in mathematics). Some problems in mathematics can be traced to reading disorders. For example, LD students may be unable to solve math word problems because of difficulty decoding and comprenending words in the problem (Crawley, Miller, & School, 1987). Selecting a problem-solving strategy may also prove difficult for many LD students. Finally, LD students may not correctly perform needed calculations, though at the high school level LD students will have the least amount of difficulty with calculation.

Social behavior and interpersonal relationships. One way to understand why LD adolescents may have problems in the domain of social skills is to think of a reading-based metaphor. In reading, one is require to decipher and interpret symbols, relate these to past learning, and select responses which are appropriate to task demands. As mentioned above, LD students have trouble doing this. If interpersonal relationships are thought of as depending on highly-abstracted forms of symbol learning, social difficulties of LD adolescents become far less

mystifying. After all--learning is learning! In a conversation one must interpret language, paralanguage (inflection and the like), and movement--singularly abstract phenomena, but in interaction amazingly complex. Add to this the pragmatic aspects of language (those related to purposefulness) and a witches-brew of complexity results. Bryan (1986), in an excellent literature review, concluded that "... the rejection of the learning disabled is related to inadequate or inappropriate and deficient use of language in social settings" (p. 230). LD students suffer peer rejections at a rate higher than their peers and Bryan believes that this may be a function of (1) misinterpreting social signals, and (2) lack of skill in the subtleties of social language production. Thus, secondary teachers may observe LD students taking offense where none was intended or imbedding confusing or counterproductive messages in communication. Learning disabled students tend to make more inappropriate comments to peers and suffer in peer status as a result (Bruininks, 1978; Weiner, 1987).

Controversies About Characteristics

While it is clear that students labeled LD fail to achieve as expected in school, it is not entirely clear that these students can be reliably identified given our current level of testing technology. Ysseldyke and colleagues have written extensively on this topic (Ysseldyke & Algozzine, 1979; Ysseldyke & Algozzine, 1982; Ysseldyke, Algozzine, Shinn, & McGue, 1982).

Ysseldyke's findings can be summarized as follows. First,

there is considerable overlap between students labeled LD and low-achieving students not so labeled. Another way to put this is that, in many cases, LD students cannot be discriminated from other low achieving students based on test scores though there is a noteworthy tendency for the achievement of labeled children to be more severe than that of low-achieving nonlabeled students. Second, Ysseldyke and colleagues have demonstrated that interdisciplinary teams seldom rely on empirical data in making classification decisions. It has been argued that attempts to base such decisions on empirical data are thwarted by a lack of reliable and valid instruments. In light of this information, Ysseldyke and colleagues argued that the LD category may not be educationally useful. Lack of a precise definition has been blamed for overidentification of LD students.

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Gajor, A., Salvia, J., Gajria, M., & Salvia, S. (1989). A comparison of intelligence achievement discrepancies between learning disabled and non-learning disabled college students. Learning Disabilities Research, 4, 119-124.

Gajor et al compared a group of college students enrolled in a university LD program with a sample of non-LD freshmen. Students were administered the Wechsler Adult Intelligence Scale - Revised (WISC-R) and the achievement portion of the Woodcock-Johnson Psychoeducational Battery. Intelligence scores were used to predict performance on the math, written language, and knowledge clusters on a subsample of students matched for IQ.

The purpose of the study was to determine the degree to which the ability (IQ) - achievement/discrepancy could be observed in university students.

The LD group differed significantly on intelligence test scores from non-LD, randomly-selected freshmen contrary to what is generally stated about secondary and post-secondary LD students. In the IQ-matched subgroups, however, discrepancies were noted. That is, IQ's of non-LD students accurately predicted achievement. High-IQ LD students, however, performed significantly lower in reading, math, and written language than would be predicted from IQ, though Gajor et al were unable to accurately classify students on the basis of these scores.

The significance of the study is that the ability-achievement discrepancy may not be an adequate identification procedure. In fact, we may question whether this discrepancy is a real or fundamental characteristic of secondary LD students.

Weiner, J. (1987). Peer status of learning disabled children and adolescents: A review of the literature. Learning Disabilities Research, 2, 61-79.

Twenty-five studies investigating the peer status of LD children and adolescents were reviewed by Wiener. She selected studies where peer status was either compared across identified and non-LD groups or where correlates of acceptance were investigated within the LD population. In this entry, peer status findings among LD adolescents is emphasized.

Weiner found near universal agreement (among reported studies) that LD students are rated lower by their peers on sociometric measures. Of the 19 studies reviewed, 15 showed lower status among LD students and 4 reported no difference. Weiner maintained that the 4 "no difference" studies were the methodologically weaker of the 19 studies.

Weiner identified 4 questions which remain to be answered regarding the peer acceptance of LD students:

1. Do LD boys or girls differ in peer status? She found that roughly an equivalent number of studies found

effect v. no effect. However, the 3 studies which asked the question and reported an effect were in agreement that LD girls were relatively lower in peer status than LD boys.

2. Is the low status of LD children a result of (a) few popular children, (b) many isolates, or (c) many rejected students? There is no consensus on this issue at present.
3. Are peer and teacher ratings of LD children's social status correlated? There appears to be a moderate correlation between peer and teacher ratings of LD students but too few studies have been conducted to gain a clear picture on this issue.
4. To what extent are differences in peer status between LD and NLD children predicted by differences in general intelligence? Peer status and IQ are known to covary, thus Weiner argued that even the small IQ differences typically observed between LD and NLD students may make it necessary to control for IQ in future studies.

Peer acceptance is portrayed in the review as a more complex phenomenon than has been previously thought. For example, LD students' popularity is increased if they are perceived as intelligent, attractive, or athletic.

The significance of Weiner's review is its support of the lower social status of LD students. Much more research is needed in the area, yet it is clear that social isolation is a problem that a plurality of mainstreamed LD and their teachers will face.

Smith, J. O. (1988). Social and vocational problems of adults with learning disabilities: A review of the literature. Learning Disabilities Focus, 4, 46-58.

Early reports suggesting that notable high achievers such as Nelson Rockefeller suffered and overcame learning disabilities left many with the impression that LD was a "school-years" - only problem. In an extensive review of literature on LD adults, Smith argued persuasively that problems which first cause a child to be labeled LD persist through high school and into adulthood. Furthermore, it is of extreme importance for secondary educators to note that problems in reading, written language, and mathematics produce real disabilities in the vocational and social-emotional domains.

Chronic un- and under-employment was nearly a universal finding in studies reviewed by Smith. Both LD adults and their parents reported increased vocational support as a primary need in secondary programs. It was reported by significant others that LD adults suffered significant social and emotional problems. One common problem reported which deserves the attention of secondary educators was impulsivity ("talking and acting before thinking" p. 53).

Margalit, M., & Shulman, S. (1986). Autonomy perceptions and anxiety expressions of learning disabled adolescents. Journal of Learning Disabilities, 19, 291-293.

Margalit and Shulman asked whether prolonged assistance in the form of remedial programming may produce results "appositive to autonomous development" (p. 291) in LD adolescents. Here autonomy was defined as the ability to solve problems independently in the face of pressure from peers or parents. The role of anxiety in the behavior of LD adolescents was also explored. Results indicated that LD adolescent boys demonstrated significantly lower scores on an autonomy measure than a sample of their non-LD counterparts. Specifically, LD students were less willing to select and pursue goals in opposition to their parents, peers, and showed less willingness to operate independently in traumatic situations. LD students scored significantly higher on estimates of state (situational) and trait (personality) anxiety. These results suggest that some LD adolescents may be more dependent and anxious than their non-LD peers. However, results must be interpreted cautiously. These data are generated via questionnaires and there was no discussion of instrumental validity in terms of correlation with behavior in natural environments.

McConaughy, S. H. (1986). Social competence and behavioral problems of learning disabled boys aged 12-16. Journal of Learning Disabilities, 19, 101-105.

Scores on the Child Behavior Checklist were obtained on 53 boys between the ages of 12 and 16 (mean IQ = 90.3). This instrument is an interview-format checklist where parents are asked to check statements regarding their children's social competence and behavior problems. Profiles thus derived were compared with the instrument's normative sample. LD boys scored significantly lower on all social competence subscales (participation in activities, social contacts, social competence in school, and total score). In addition, LD students scored significantly higher on all dimensions of problem behavior assessed. The mean scores for LD boys exceeded the 90th percentile for the non-LD sample group on scales for immaturity, hostile-withdrawal, aggressiveness, and hyperactivity. Secondary students with learning disabilities appear to be at-risk for social-emotional problems. McConaughy pointed out that there was a remarkable similarity between the mean profiles for this LD sample and normative data from the same instrument derived from children referred for emotional disturbance.

McCue, P. M., Shelly, C., & Goldstein, G. (1986). Intellectual, academic and neurophysocological performance levels in learning disabled adults. Journal of Learning Disabilities, 19, 133-236.

Descriptive data on psychological test performance was derived for 100 LD adults from 17 to 66 years of age. Contrary to the federal definition which posits normal intelligence, McCue et al reported a full scale WAIS (IQ of 88.64) typical of younger LD students, these adults showed a tendency to score slightly higher on performance than verbal IQ. This means that they will do better on such non-abstract tasks as object assembly than on vocabulary or mathematics and reading comprehension. Grade level scores were as follows: overall reading - 5.59, reading comprehension - 4.96, arithmetic grade level - 4.80, and spelling - 4.37. These results indicate that adults retain earlier-diagnosed learning disabilities.

In addition, highly abstracted presentations (one's relying entirely on symbols) will relatively most difficult for LD secondary students.

Algozzine, B., O'Shea, D. J., Stoddard, K., & Crews, W. B. (1988). Reading and writing competencies of adolescents with learning disabilities. Journal of Learning Disabilities, 21, 154-158.

Many states have instituted minimum competency testing (MCT) in order to ensure that graduates achieve a predictable level of performance. Algozyine et al examined the possibility that LD adolescents may not be able to pass these tests due to reading and written language difficulties. A random sample of the scores of approximately 1000 Ld and non--LD students on the communication portion of Florida's MCT was collected. Nonhandicapped students outperformed LD students on total communication competence (91% v. 49% mastery) and in virtually every subtest. LD students performed lowest on items "involving written communication," and "using appropriate business letters" LD students scored highest on the reading subtests measuring factual recall and in writing items involving checks and money orders.

These data indicate that LD students continue to show written language deficits into the adolescent years. These deficits may be severe enough to prevent many such students from passing MCT's.

Ganschow, L., Myer, B., & Roeger, K. (1989). Foreign language policies and procedures for students with specific learning disabilities. Learning Disabilities Focus, 5, 50-58.

Perhaps 1% of college students have a learning disability. Or, put another way, up to 5% of LD students continue their

education at the college level. One concern faced by secondary educators, particularly school counselors, is whether language requirements for high school graduation should be enforced for LD students particularly in cases where the student may be considering college.

In order to provide a data base for decision making in the area of foreign language instruction, Ganschow et al. surveyed four- year colleges regarding their language requirements.

As might be expected, there were both between- college differences and variability between departments within colleges. Eighty-eight per cent of International Studies programs, for example, required foreign languages (across universities). Approximately 60% of science programs enforced language requirements: business, health, and agriculture programs required foreign languages at the lowest rates (all near 50%). This information could be used to guide career and college choices for LD high school graduates. Many colleges will waive foreign language requirements or provide alternative experiences but Ganschow et al. suggest that the process for altering requirements is complex and will require mentorship.

Cawley, J.F., Miller, J. H., & School, B. A. (1987). A brief inquiry of arithmetic word--problem--solving among learning disabled secondary students. Learning Disabilities Focus, 2, 87-89.

Cawley et al. designed a set of arithmetic word problems to reveal specific difficulties experienced by LD adolescents (63 middle and high- school LD students). No correlation was observed between IQ and total score on the math test. This matches expectations associated with the achievement--ability discrepancy posited for LD students.

A significant relationship was observed between reading grade equivalent and math performance. Both math and reading tests independently predicted performance on the word problem test. Other variables tested were "directness" (direct = wording consistent with the implied operation) and occurrence v. nonoccurrence of extraneous phrasing in the problem.

LD students had relatively most difficulty with indirect referents to operations, though extraneous wording was also problematic. Approximate percent correct for the four categories resulting from crossing the independent variable conditions were as follows (collapsed across operations): Direct--nonextraneous = 86, direct--extraneous = 70, indirect--nonextraneous = 75, indirect--extraneous = 56.

Ysseldyke, J.E., Algozzine, B., Shinn, M.R., & McGue, M. (1982). Similarities and differences between low achievers and students classified learning disabled. The Journal of Special Education, 16, 82-84.

Ysseldyke et al generated a sample of students labeled LD under federal regulations and a matched group of nonlabeled, but low--achieving students. A considerable battery of psychological and educational measures were collected on these subjects with the aim of identifying a set of psychometric indices of learning disabilities.

Despite a general trend for LD youngsters to score lower on the tests, no clear pattern of discriminators were observed. On the 44 subtest scores entered into the analysis, the approximate overlap between groups averaged about 96%. Selected subtest scores and associate percent overlap between LD and low achieving students were WISC-R Arithmetic = 100%, WISC-R full scale = 99%, Stanford Math Calculation = 99%, and Woodcock Johnson Calculation = 99%. The lowest percent overlap was noted on the Peabody Individual Achievement Test (88%) and Woodcock-Johnson Letter Word Identification (82%). Ysseldyke et al argued that the amount of overlap observed indicated that LD was not a reliably--identifiable separate category and that use of the label should be reconsidered.

Bryan, T. (1986). A review of studies on learning disabled children's communication competence. In R. L. Schiefelbusch (Ed.), Language competence. Assessment and intervention (pp. 227-259.

Bryan observed that LD students as a group have lower social status than their nondisabled counterparts. In this review chapter, She outlined the possibility that LD students may suffer social rejection as a function of inappropriate language use. The following domains are reviewed: Adjusting communicative style to the age of the listener, adjusting content for the knowledge base of listeners, and conversational turn--taking.

Children as young as 4 years of age are observed to adjust speech to ages and prestige of listeners. For example, when instructing younger children, most students use less complex linguistic units. Ld students are less able to tune communication to age:

> ...these data suggest that the learning disabled are discrepant in various ways from nondisabled children in their ability to make listener--related speech adjustments (p. 235).

In adjusting communication for the knowledge base of the listener, LD students are not clearly differentiated from their non--LD counterparts. Their performance in this domain is relatively poor, however, when the task is ambiguous or where the LD person must actively seek information. According to Bryan, less information is embedded in the speech of LD students.

According to Bryan, LD students are able to participate in the give-and-take of conversation nearly as well as nondisabled students. While the structure of conversations across groups was similar, the language of LD students could be described as more

unsophisticated. In addition, LD students were unskilled in the types of behaviors required to keep a social exchange going (such as questioning), though it is not clear whether this is a function of lower status or a pragmatics problem.

Smith, S.L. (1988). Typical learning problems of learning-disabled children. The Pointer, 32(3), 8-10.

Smith compiled and presented a list of the types of behaviors that both elementary and secondary educators may observe in Ld students. She compiled lists in several categories including, reading, language, spelling, handwriting, arithmetic, thinking, and school (behavior). Reading problems relevant to secondary educators include missing details of letters and words, losing one s place on the page, and reads slowly--tires easily. Language problems include syntax (organizational) difficulties both spoken and written, trouble following directions, becomes distracted when discussion is primarily oral. School/behavioral problems include the following: erratic and inconsistent, sometimes appears lazy or disinterested, poor attending behavior, and poorly organized. Unfortunately, the data base of Smith's list is not clearly established in the publication.

Levin, E.K., Zigmond, J., & Birch, J. W. (1985). A follow-up study of 52 learning disabled adolescents. Journal of Learning Disabilities, 18, 2-6.

Levin et al. collected extensive 4--year follow up data on 52 LD students entering high school (9th grade) together. At the time of data collection, the 46 males and 6 females in the sample should have been 12th graders. Researchers correlated 9th grade characteristics with selected outcome variables.

Several 9th grade descriptive variables were reported. IQ's of the subjects averaged 88.37 (full scale), their Peabody Individual Achievement Test (PIAT) reading composite score was 4.71 (grade level), and they averaged 6.17 on the PIAT math subtests.

Nearly half of the students had dropped out of high school between 9th and 12th grade. Thirty-four students were located and retested, achieving an approximate grade level of 6.0. Interestingly, LD drop outs scored lower (5.45 than those being served in special education (6.37) and those who were 100% mainstreamed (8.59). Finally, statistical analysis indicated that reading and math scores at the beginning of 9th grade were the best predictors of group membership at 12th grade (drop out v. special education v. mainstreamed).

Buchanen, M., & Wolf, J.S. (1986). A comprehensive study of learning disabled adults. Journal of Learning Disabilities, 19, 34-38.

In the Buchanen and Wolf study, 33 LD adults were interviewed and tested to quantify the nature and severity of a

learning disability during the adult years. Subjects indicated 5 problem areas in their lives, hyperactivity, organization, affect, poor self image, and motivation. Significantly, these adults self-reported problems parallel to those reported (of them) by others such as teachers and parents. Nearly 80% (78.8) reported that high school was a negative experience.

Subjects scored in the average range of intelligence (mean = 103.5), but significantly below average in reading, math, and and written language (35.7, 42.7, and 27.5, percentile ranks for respectively reading, math, and written language). Buchanen and Wolf summarized their findings by writing that..."many of the characteristics of learning disabled children described in the literature...seem to persist into adulthood (p. 38).

Lerer, R.J. (1987). Motor tics, Tourette syndrome, and learning disabilities. Journal of Learning Disabilities, 20, 266-268.

The most common involuntary movement disorder among children and adults is tics..."of the face, neck, shoulders, and arms" (p. 266). If the tics are severe, persistent, and accompanied by vocalizations the child may have both a learning disability and Tourette syndrome. Vocal tics include such sounds as..."grunting, sniffing, snorting, barking, whistling, coughing, throat clearing, humming, or croprolalia (involuntary utterances of vulgar or obscene words)" (p. 266).

Tourette syndrome, though rare (between 0.1 and 0.5 cases per 1000), is related to more common learning disabilities because the symptom package may include learning problems and hyperactivity. Lerer argued that "awareness and sensitivity improve acceptance by peers and educators (p. 267).

Gajar, A.H. (1987). Foreign language learning disabilities: The identification of predictive and diagnostic variables. Journal of Learning Disabilities, 20, 327-330.

Gajar attempted to determine which factors predict ability to learn an foreign language (FL) and to develop a methodology for determining whether a student suffers a specific disability in this area. It is expected that LD students have difficulty learning a FL because of syntactic and auditory discrimination problems observed as the native language is acquired.

Among college students, scores on 2 subtests of the Modern Language Aptitude Test predicted performance of students in FL classes. Low scores on tests of 'sensitivity to grammatical structures' (MLAT-4) and memory (MLAT-5) were associated with failure of otherwise excellent students in FL classes. It is possible that this information could be used to predict which high school LD students are good candidates for passing FL courses with assistance .

Jenkins, J.R. (1987). Similarities in the achievement levels of learning disabled and remedial students. Counterpoint, 7(3), 16.

Remedial, special education and nonserved students in 28 school districts were tested for similarities and differences in reading, spelling and mathematics achievement. Remedial students were defined as those receiving Chapter 1 services or through a state-run program. The achievement batteries employed by individual districts were employed with all scores being converted to normal curve equivalents.

LD students' mean performance significantly differed from the low achieving (remedial) students on reading and arithmetic but not spelling. As Jenkins stated, "LD students are the lowest of the low achievers" (p. 16). Approximately 85% of LD students scored below an SCE of 40 (the lowest group), while 70% of remedial students and 13% of nonserved students.

Noteworthy similarities were also observed between scores of remedial and LD students. Even with outliers removed so as to not overestimate overlap, the LD and remedial groups were very comparable in range:

> In fact there is overlap in the distribution at every point along the NCE scales, suggesting that for nearly every student in one group there is another student in the other group who has obtained a like score" (p.16).

Jenkins concluded that in the most instructionally relevant dimension, range, LD and other low functioning students are very similar.

Smith, C.R. (1985). Learning disabilities: Past and present. Journal of Learning Disabilities, 18, 513-517.

The heterogenous nature of learning disabilities is emphasized by Smith. She pointed out that since nearly 100 separate characteristics of LD youngsters have been posited, it is not surprising to find very few children sharing the same patterns of disabilities. Even when manifestations of learning difficulties are similar, such setting characteristics as background and previous schooling will impact on learning:

> The group we call learning disabled is so highly heterogenous that no two students are likely to share precisely the same assessment and teaching needs (p. 513).

Smith proposed an alternative model of assessment which will allow educators to match learning characteristics of the child with task demands and teaching style in the classroom. The model is cubic and has as its factors, individual characteristics for example, cognitive ability and style), task-based contributors (match of learning tasks to the "style" of the student), family-based contributors (such as the home's emotional climate), and physiological learner-based contributors (possible organic

factors which may impact on learning. Smith argued that the model can guide practice and could direct assessment research which takes proper account of the heterogenous nature of the LD population.

Adelman, H.S., & Taylor, L. (1986). Summary of the survey of fundamental concerns confronting the LD field. The Journal of Learning Disabilities, 19, 391-393.

Adelman and Taylor reported results of an extensive survey of LD professionals in the areas of theory and research, practice, and training. LD specialists felt that advanced theories of learning should be incorporated in the Ld field. Many felt that the lack of a unifying or global theoretical perspective left the field in disarray. In the practical domain, LD professionals were most interested in developing methods for clustering sets of characteristics into defensible subtypes and relating these subtypes to particular instructional methods. The attempt to find instructionally-relevant subgroups within the LD population has received considerable attention in the research literature over the past 5 years.

Stein, R.A., & Hoover, J.H. (1989). Manifest anxiety in children with learning disabilities. Journal of Learning Disabilities, 22, 66,71.

Part of the justification for integration or mainstreaming was that mixing handicapped and nonhandicapped students would decrease some of the interpersonal difficulties that attend segregated services. However, it has been shown that mere mixing of students does not eliminate social, interpersonal or academic problems. Rather, positive, planned steps must be taken to assure that the mainstream experience is beneficial for those involved. Stein and Hoover investigated the possibility that placement in competitive classes might increase the anxiety of some adolescent LD students. Three groups were compared for manifest anxiety, LD students placed full-time in segregated classes, mainstreamed LD students (at least half days), and nonhandicapped students. The mainstreamed LD group scored highest on the anxiety scale, differing significantly from nonhandicapped students. The effect was small, however, because the two groups of LD students did not differ. Results supported previous findings that LD students experience more anxiety. Cetainly, it cannot be argued that mainstreaming reduces anxiety as some might expect.

Gibbs, D.P., & Cooper, E.B. (1989). Prevalence of communication disorders in students with learning disabilities. Journal of Learning Disabilities, 22, 60-63.

The federal definition of learning disabilities refers to associated psycholinguistic problems. In addition, federal

regulations allow a learning disability to be diagnosed if there is a discrepancy between ability and achievement in oral expression, listening comprehension, and written expression--all aspects of communication.

Gibbs and Cooper conducted speech, language, and hearing assessments on all 242 students identified as LD in one Alabama school district. According to the authors' analysis, 96.2% of the sample were diagnosed as having communication or hearing disorders with the following specific percentages: articulation disorders = 23.1%, language disorders = 90.5%, fluency disorders = 1.2%, voice disorders = 12.0%, disorders of hearing pure tones = 7.4%, and problematic inner ear function = 15.7 %. Articulation disorders and problems understanding and generating language are much more prevalent among these LD students than in the general population (the usual figure for articulation disorder is, for example, about 5%).

Johnson, C.L. (1984). The learning disabled adolescent and young adult: An overview and critique of current practice. Journal of Learning Disabilities, 17, 386-391.

According to Johnson, adolescent LD students should be carefully and frequently reevaluated because the condition appears to interact with this period of life to produce changes in characteristics. The most common probelms remaining through the adolescent years are "hyperactivity, emotional lability, poor handwriting, a relatively short attention span..., thinking difficulties, and specific language disorders" (p. 387). Thinking difficulties refer to the inability to memory shortcomings and disorganized cognition.

Torgesen, J.K. (1986). Learning disabilities theory: Its current state and future prospects. Journal of Learning Disabilities, 19, 399-407.

In this wide-ranging paper, Torgesen discussed some of the conceptual problems in the LD field. Primary among these is the confusion engendered by differences in theoretical orientations between competing researchers. According to Torgesen, there are presently three major perspectives driving theory and in light of which LD characteristics are studied, the neuropsychological paradigm, the information processing paradigm, and the applied behavior analysis paradigm.

The neuropsychological view was characterized as an attempt to correlate academic and other learning problems to structural damage in the brain. Because of a lack of useful instrumentation, this line of research was not considered fruitful for a long period of time. Now, however, with new techniques there may be a consensus emerging that an educationally relevant distinction can be made between linguistic and visuo-spatial processing.

Information processing theorists examine the effects of task demands on students' ability to act on information. By measuring such variables as reaction time, researchers are attempting to pinpoint the types of processing difficulties which inhibit the performance of LD students. Torgesen cited his own extensive work which points to an inefficiency in strategy production and use as an important processing deficit in LD students. Torgesen contrasted neuropsychological and information theories, where attempts are made to find specific disorders with the applied behavioral view where LD characteristics are conceptualized in terms of a few learning principles. He argued that behaviorists act "...as though all learning failure results from a lack of properly reinforced practice or from learning inappropriate responses to educational stimuli" (p. 403).

Stiliadis, K., & Wiener, J. (1989). Relationship between social perception and peer status in children with learning disabilities. Journal of Learning Disabilities, 22, 624-629.

Two measures of social perception were collected on matched samples of 30 LD and non-LD 9- to 12-year-olds. The authors were interested in assessing the relationship between teacher ratings of social perception, laboratory measures of the same skill, and social acceptance. Results of the study supported the hypothesis that LD children lack skill in the ability to "read and/or interpret social cues" (p. 624). A correlation was observed between teacher ratings of social perception and status as determined by peer rating. Interestingly, the laboratory measure of social perception did not correlate with status. Stiliadis and Weiner discussed this finding in terms of the validity of experimental studies based on contrived situations. These results can be taken as supporting the notion that LD youngsters have difficulty interpreting social cues and that this may be a factor in their low status.

Cawley, J. F., Kahm, H., & Tedesco, A. (1989). Vocational education and students with learning disabilities. Journal of Learning Disabilities, 22, 630-634.

Cawley et al described the performance of nearly 500 LD students enrolled in vocational and technical educational programs. Because LD adults are unemployed and underemployed at a high rate, transition services have taken on a new importance. The program described in this paper is a transition program where special education teachers provide consultation and direct support for students enrolled in high school vocational programs.

Results indicated that, with support, many LD students benefit from vocational programming. Over 50% of the LD students consistently passed courses, ratings of their attendance were sanguine, and a variety of career options were experienced by students.

Safer, D.J. (1986). Nonpromotion correlates and outcomes at different grade levels. Journal of Learning Disabilities, 19, 500-503.

Safer pointed out that reasons for nonpromotion at the elementary level are reasonably well documented. Such factors as misconduct, low academic achievement, low IQ, low socioeconomic status, and hyperactivity have been documented. Less is known, according to Safer about correlates and results of nonpromotion at the junior high school (JHS) level.

Safer found that JHS grade retention was associated with misconduct and absenteeism. Safer also found that only 15% of nonpromoted JHS students performed at grade level the second year. This study and others like it are important for LD practice. The problems associated with nonpromotion at the elementary level, academic problems, are the defining characteristic of learning disabilities. At the JHS level, the low social status and social perceptual problems of LD students put them at risk for grade retention, particularly if they are not identified. It is important to recognize that grade retention, like LD itself adds to the probability of dropping out.

Aspects of the Federal Definition Of Learning Disabilities

1. Information Processing Deficits
2. Psycholinguistic Considerations
3. Academic and Learning Difficulties
4. The exclusionary Clause

What is the "Discrepancy"?

1. The discrepancy is between ability and achievement
   a. ability is measured via an individually-administered test of general intelligence (IQ)
   b. achievement is measured by specific achievement tests or achievement batteries
2. The discrepancy must be severe. Most states use a formula taking into account age, IQ, achievement test score, and the correlation between tests used.

Achievement Domains Identified by Federal Regulations Where Discrepant Performance May be Observed

1. Oral Expression
2. Listening Comprehension
3. Written Expression
4. Basic Reading Skills
5. Reading Comprehension
6. Mathematics Calculation
7. Mathematics Reasoning

Typical Tests Used in Establishing LD

Ability Tests

1. Stanford-Binet Test of Intelligence
2. Wechsler Intelligence Scales for Children--Revised
3. Wechsler Adult Intelligence Scales--Revised
4. Woodcock Johnson Psychoeducational Battery--Part I
5. Kauffman Assessment Battery for Children

The Ten Most Common LD Characteristics According to Clements (1966)

1. hyperactivity
2. perceptual-motor impairments
3. emotional lability
4. general coordination deficits
5. disorders of attention
6. impulsivity
7. disorders of memory and thinking
8. specific academic problems
9. disorders of speech and hearing
10. soft signs of brain dysfunction

Typical Tests Used in Establishing LD

Achievement Tests

1. Wide Range Achievement Test
2. Peabody Individual Ach. Test
3. Kauffman Tests of Educat. Ach.
4. Keymath
5. Woodcock Johnson Reading Mastery
6. Test of Adolescent Language
7. Test of Written Language
8. Test of Written Spelling
9. Woodcock Johnson Psychoeducational Battery--Part II (Tests of Ach.)

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Strauss Syndrome Characteristics Which May Appear in Some LD Students

1. Erratic and inappropriate behavior on mild provocation
2. Increased motor activity disproportionate to the stimulus
3. poor organization of behavior
4. distractibility of more than ordinary degree
5. persistent faulty perceptions
6. persistent hyperactivity
7. awkwardness and poor motor performance

Dyslexia Means "Can't Read"

The term is a name not an explanation. Dyslexia means, quite literally, being unable to read. Children who are experiencing difficulty learning to read are frequently called dyslexic, but their difficulty does not arise because they <u>are</u> dyslexic, or <u>have</u> dyslexia; they are dyslexic because they cannot read (Smith, 1978, p. 149).

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Learning and Memory Characteristics

Use of Cognitive Strategies

LD students often fail to take appropriate actions when they are faced with a learning task. That is, they do not select or use appropriate learning and memory strategies.

Metacognition

Most adolescents are aware of the need to select and monitor a learning strategy. This awareness of one's own learning and memory is called "metacognition" and is seen as a problem area for LD students.

Reading Problems

1. Below Grade Level: LD adolescents may show skills ranging from total word blindness to a 4th grade level.
2. Mechanical Problems: Most LD students reverse letters and words, misread words, and have a limited "sight" vocabulary.
3. Rate: Most LD readers will read haltingly. It will take a typical secondary LD student from 30% to 100% longer to read the same material as an average student.
4. Comprehension: LD students perform, on average, poorer than their non-LD counterparts in the ability to comprehend reading material. This deficit will probably not extend to material they hear.

Written Language Problems

1. Handwriting: Many LD students will have difficult to read handwriting. In addition, the production rate of some will be slow.
2. Spelling: The magnitude of spelling difficulties will be roughly equal to those in reading.
3. Written Production: LD students have been shown to produce fewer words, sentences and idea units. In many cases, syntax and punctuation will be poor.

Other Problem Areas

1. Mathematics: While learning specific to mathematics are relatively rare, many LD students will have trouble with math due to their problems in reading (related to the interpretation of symbols).
2. Social/Interpersonal: On average, LD adolescents are less popular with peers. This has been attributed to problems interpreting the social content of language and the prevalance of inappropriate social behaviors.

Controversial Aspects of the LD Definition

1. Discrimination: It is difficult to discriminate LD students from other (non-LD) low achievers based on standardized testing.

2. Testing Accuracy: Interdisciplinary teams do not always base the diagnosis of LD on reliable test data. Reliable tests are not available for all achievement areas. Because of the lack of testing accuracy, too many students are probably being labeled LD.